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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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PILLSBURY WINTHROP SHAW PITTMAN LLP
P.O. BOX 10500
MCLEAN, VA 22102

EXAMINER	
NG, CHRISTINE Y	
ART UNIT	**PAPER NUMBER**
2616	

DATE MAILED: 08/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/546,494	AHLFORS ET AL.	
	Examiner	Art Unit	
	Christine Ng	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25 and 28-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7,11,18,21,28-31,34,38,45 and 48* is/are rejected.

7)☒ Claim(s) *5,6,8-10,12-17,19,20,22-25,32,33,35-37,39-44,46,47 and 49-52* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 April 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-4, 7, 11, 18, 21, 28-31, 34, 38, 45 and 48 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 3 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 line 2: It is unclear whether or not "." should be changed to --,--.

In claim 3 line 2: It is unclear where the "port" is located relative to the switching fabric, bandwidth scheduler, and queues of the switch. It is unclear whether the port is a source or destination port before or after the queues.

In claim 30 line 2: It is unclear where the "port" is located relative to the switching fabric, bandwidth scheduler, and queues of the switch. It is unclear whether the port is a source or destination port before or after the queues.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 11, 28-30 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,104,700 to Haddock et al.

Referring to claims 1 and 28, Haddock et al disclose in Figure 1B a method for bandwidth scheduling in a switch (100) comprising a switching fabric (packet classification 150 and comparison engine 155) and a bandwidth scheduler (enqueue 161 and buffer manager 165) located before any queue (QoS queues 180) of the switch. Refer to Column 4, lines 53-67. As shown in Figure 2, the method comprises:

Receiving (220) a stream of data (data stream in) from the switching fabric. Refer to Column 9, line 32.

Extracting (230) flow identity information (QoS criteria in the packet header) from the stream. Packets are assigned to QoS traffic queues 180 based on header information such as source and destination ports, IP source and destination addresses, etc. Refer to Column 5, lines 31-49; and Column 9, lines 32-42.

Updating counters (current queue depth) corresponding to the stream. For each queue 180, the buffer manager 165 keeps track of the current queue length with each additional packet to ensure that the maximum queue length is not exceeded. Refer to Column 6, line 56 to Column 7, line 8.

Subjecting (250) the stream to a decision making algorithm in the bandwidth scheduler based on the extracted flow identity information and the updated counters for that particular stream resulting in that the stream is accepted or rejected before it enters

any queue of the switch. If the QoS queue 180 length for a particular packet remains less than or equal to the maximum length, the packet is added to the QoS queue. If the QoS queue length would exceed the maximum length by the addition, then the packet is dropped. Refer to Column 9, lines 43-57. Additional packets from the stream belonging to the QoS queue will also be dropped or accepted depending on the length of the queue, so the method also applies to a stream of data. If a QoS queue 180 is full, all packets of the stream belonging to that queue will be dropped.

Referring to claims 2 and 29, Haddock et al disclose that the stream of data includes identifiable data packets and subjecting each cell to a decision making algorithm in the bandwidth scheduler resulting in that the data packet is accepted or rejected. The method of Figure 2 also applies to individual packets of the incoming data stream. Refer to the rejection of claims 1 and 28.

Referring to claims 3 and 30, Haddock et al disclose that the flow identity information includes port, identified by port number, and traffic class (QoS). Packets are separated into different traffic QoS groups based on header information. The network manager may provide information indicative of TCP source and destination ports to identify traffic groups. Or, if the QoS policy is physical topology based, physical port numbers may be used to differentiate traffic groups. Refer to Column 5, lines 31-49.

Referring to claims 11 and 38, Haddock et al disclose that each traffic class is guaranteed a bandwidth up to a limit. "Minimum bandwidth indicates the minimum

amount of bandwidth a particular traffic group needs to be provided over a defined time period". Refer to Column 8, lines 9-15.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 4, 7, 18, 31, 34 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,104,700 to Haddock et al in view of U.S. Patent No. 6,628,609 to Chapman et al.

Referring to claims 4 and 31, Haddock et al do not include that a limit is set on the maximum accepted bandwidth per port.

Chapman et al disclose in Figure 4 that each port is assigned a maximum bandwidth. Certain traffic classes, after using up its reserved bandwidth, are able to compete with other permitted classes for any available bandwidth from the port if they have more traffic to send. Refer to Column 9, lines 37-42. In the case that separate traffic classes are competing for spare bandwidth, each class will be limited by the maximum allocated bandwidth settings of each port, thus allowing fair share of bandwidth among ports of a switch. Refer to Column 13, lines 4-20. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to assign a maximum accepted bandwidth per port; the motivation being to allow

fair share of bandwidth among ports of a switch, thereby preventing a particularly active traffic flow traveling through a port to utilize all the available bandwidth.

Referring to claims 7 and 34, Haddock et al disclose that a limit is set on the maximum accepted bandwidth per traffic class. "Maximum bandwidth is the maximum sustained bandwidth the traffic group can realize over a defined time period". Refer to Column 8, lines 16-30.

Referring to claims 18 and 45, Haddock et al do not include that if one traffic class is particularly active, it is forced to give up part of its accepted bandwidth.

Chapman et al disclose a related example of a control mechanism. A traffic class (C2) is utilizing 4 Mb/s of bandwidth, which is over its associated port's (Port A) minimum allocated bandwidth of 1 Mb/s, to transmit upstream data to Port A. Another node needs to transmit downstream data to Port A, so C2 is forced to restrict its data rate to Port A's minimum allocated bandwidth. Refer to Column 22, lines 3-26. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include that if a traffic class becomes particularly active, it must be forced to give up some of its accepted bandwidth; the motivation being that this prevents active traffic flows from utilizing all the available bandwidth, thereby allowing less active traffic flows to achieve their guaranteed minimum bandwidth.

8. Claims 21 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,104,700 to Haddock et al in view of U.S. Publication No. 2002/0097736 to Cohen.

Haddock et al do not disclose that flows are grouped together by means of a hash function into a set of flow groups.

Cohen discloses in Figure 1 that flows to a processor (Element 50) are grouped together by means of a hash function into a set of flow groups. The use of the hash function allows the system to "distribute the flows, making sure that packets within the same flow are sent to the same processor so that the original packet order in each flow is maintained" and that different flows are sent to different processors (Element 50). Refer to Paragraph 0013. The hash function is used because "it distributes packets evenly among the processors in response to flow information such as the source/destination address, source/destination port and the protocol" (Paragraph 0042). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that flows are grouped together by means of a hash function into a set of flow groups; the motivation being that the hash function allows for flows of a common source and destination to be grouped together and distributed evenly among its destination points in response the flow information.

Allowable Subject Matter

9. Claims 5, 6, 8-10, 12-17, 19, 20, 22-25, 32, 33, 35-37, 39-44, 46, 47 and 49-52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Ng whose telephone number is (571) 272-3124. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

C. Ng
July 27, 2006

HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600